Permit Modification Fact Sheet

Changes from the previous permit fact sheet are highlighted in grey.

General Information

Permit Number:	WI-0021938-10-1	
Permittee Name:	Village of Winneconne	
Address:	P O Box 650	
City/State/Zip:	Winneconne WI 54986	
Discharge Location:	NW ¼ of the SE ¼ of Section 21, T19N, R15E, Winneconne Township, Winnebago County (Lat: 44.10415º N / Lon: 88.71215º W)	
Receiving Water:	Wolf River in the Pine and Willow Rivers Watershed (WR02) in the Wolf River Basin in Winnebago County (Water Body Identification Code: 241300)	
Stream Flow ($Q_{7,10}$):	760 cfs	
Stream Classification:	Warmwater Sportfish Community, non-public water supply	
Design Flow(s)	Daily Maximum	4.382 MGD
	Weekly Maximum	2.317 MGD
	Monthly Maximum	1.784 MGD
	Annual Average	0.777 MGD
Significant Industrial Loading?	One Categorical Industrial User – Covanta Environmental Solutions (Centralized Waste Treater)	
Operator at Proper Grade?	Yes. This facility requires at least one operator certification at the basic level for subclasses: A1 – Suspended Growth Processes; B – Solids Separation; C – Biological Solids/Sludges; P – Total Phosphorus; D – Disinfection; and SS – Sanitary Sewage Collection System. Several operators are certified in all required subclasses.	
Approved Pretreatment Program?	N/A	

Facility Description

The Village of Winneconne wastewater treatment facility has an annual average design flow of 0.777 million gallons per day (MGD) with actual flows averaging 0.431 MGD during the current permit term. Wastewater is collected from the Village of Winneconne and the Town of Winneconne Sanitary District #3. The plant treatment unit processes include preliminary treatment (screening and grit removal), followed by biological treatment in a compact, package activated sludge plant with aeration basins and a single final clarifier. The plant also operates a selector section which is primarily used for filamentous growth control. Ferric chloride is used for phosphorus removal. Secondary effluent is disinfected on a seasonal basis using sodium hypochlorite solution, after which it is dechlorinated with a liquid bisulfite solution. Treated effluent is discharged to the Wolf River via Outfall 001, located on the west bank of the strait between Lake Winneconne and Lake Butte des Morts. The plant consists of two compact activated sludge plants (Plant 1 and Plant 2). Both plants will be run in parallel during high flows. Biosolids are aerobically digested, dewatered with two small Somat screw press, stored on-site in a concrete building, and land applied on approved DNR sites.

Substantial Compliance Determination

After a desk top review of all discharge monitoring reports, CMARs, land app reports, compliance schedule items, and a site visit on March 24, 2022, this facility has been found to be in substantial compliance with their current permit.

Sample Point Designation		
Sample Point Number	**Discharge Flow, Units, and Averaging Period**	**Sample Point Location, WasteType/sample Contents and Treatment Description (as applicable)**
701	0.455 MGD (Ann. Avg. 4/1/2017 to 8/31/2022)	Influent: Representative samples shall be collected from the automatic sampling device drawing samples from the influent wet well following screening.
001	0.431 MGD (Ann. Avg. 4/1/2017 to 8/31/2022)	Effluent: Representative samples shall be collected from the end of the chlorine contact basin.
002	Did not land apply sludge from this outfall during past 5 years.	Liquid Sludge: Aerobically digested liquid. Representative samples shall be collected.
003	48 dry US tons (Permit Application)	Cake Sludge: Aerobically digested liquid sludge from sample point/outfall 002 that has been dewatered by two screw presses. Representative samples shall be collected.

1 Influent - Proposed Monitoring

Sample Point Number: 701- Influent

Monitoring Requirements					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		mg/L	3/Week	24-Hr Flow Prop Comp	
Phosphorus, Total		mg/L	Weekly	24-Hr Flow Prop Comp	

Changes from Previous Permit:

There have been no changes to influent monitoring parameters or monitoring frequencies.

Explanation of Limits and Monitoring Requirements

Monitoring Frequency Evaluation: Influent monitoring frequencies for BOD_5 and total suspended solids (TSS) are typically set equal to effluent monitoring frequencies for those parameters. The effluent monitoring frequencies for BOD_5 and total suspended solids (TSS) are 3/Week in the proposed permit and therefore influent monitoring frequencies for those parameters are also 3/Week. See effluent "Monitoring Frequency Evaluation" for Outfall 001below for details. Influent phosphorus monitoring is typically not required and the monitoring frequency of Weekly is adequate for an operational parameter.

Flow, BOD_5 and TSS – Section NR 210.04(2), Wis. Adm. Code, requires that influent wastewater strengths and volumes at municipal wastewater treatment facilities be characterized by monitoring for flow, BOD_5 and TSS. Influent monitoring for these parameters is also required to demonstrate the percent removal requirements for BOD_5 and TSS in s. NR 210.05, Wis. Adm. Code, and in the Standard Requirements section of the permit.

Phosphorus – Influent phosphorus monitoring provides information for treatment facility operators to adjust chemical feed rates for phosphorus removal efficiency

2 Surface Water - Proposed Monitoring and Limitations

Sample Point Number: 001- Effluent

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Flow Rate		MGD	Daily	Continuous	
BOD5, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
BOD5, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	45 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	30 mg/L	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Weekly Avg	402 lbs/day	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total	Monthly Avg	285 lbs/day	3/Week	24-Hr Flow Prop Comp	
Suspended Solids, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of TSS and report on the last day of the month on the DMR. See the standard requirements for 'Appropriate Formulas for Effluent Calculations'.
Suspended Solids, Total		lbs/yr	Monthly	Calculated	Calculate the 12-Month Rolling Sum of Total Monthly Discharge of TSS

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					and report on the last day of the month on the DMR. See the standard requirements for 'Appropriate Formulas for Effluent Calculations'.
pH Field	Daily Min	6.0 su	5/Week	Grab	
pH Field	Daily Max	9.0 su	5/Week	Grab	
E. coli	Geometric Mean - Monthly	126 #/100 ml	Weekly	Grab	Limit Effective May through September annually.
E. coli	% Exceedance	10 Percent	Monthly	Calculated	Limit Effective May through September annually. See the E. coli Percent Limit section of the permit. Enter the result on the DMR on the last day of the month.
Chlorine, Total Residual	Daily Max	38 ug/L	5/Week	Grab	Limit effective May through September annually, and whenever chlorinating.
Chlorine, Total Residual	Weekly Avg	38 ug/L	5/Week	Grab	Limit effective May through September annually, and whenever chlorinating.
Chlorine, Total Residual	Monthly Avg	38 ug/L	5/Week	Grab	Limit effective May through September annually, and whenever chlorinating.
Phosphorus, Total	Monthly Avg	1.0 mg/L	3/Week	24-Hr Flow Prop Comp	This is an interim limit effective throughout the permit term.
Phosphorus, Total		lbs/day	3/Week	Calculated	The final total phosphorus TMDL mass limits are 3.9 lbs/day as a monthly average and 1.3 lbs/day as a 6-month average and go into effect pursuant to the TMDL WQBELs for Total Phosphorus schedule. See phosphorus sections of the

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
					permit for compliance alternatives.
Phosphorus, Total		lbs/month	Monthly	Calculated	Calculate the Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See the standard requirements for 'Appropriate Formulas for Effluent Calculations'.
Phosphorus, Total		lbs/yr	Monthly	Calculated	Calculate the 12-Month Rolling Sum of Total Monthly Discharge of phosphorus and report on the last day of the month on the DMR. See the standard requirements for 'Appropriate Formulas for Effluent Calculations'.
Nitrogen, Ammonia Variable Limit		mg/L	3/Week	24-Hr Flow Prop Comp	Using the daily pH result look up the variable daily maximum ammonia limit in the 'Variable Daily Maximum Ammonia Limit' table in the permit. Enter the variable limit in the 'Ammonia Variable Limit' column on the DMR.
Nitrogen, Ammonia (NH3-N) Total	Daily Max – Variable	mg/L	3/Week	24-Hr Flow Prop Comp	Report the daily ammonia result on the DMR. Compare to the 'Ammonia Variable Limit' to determine compliance.
Nitrogen, Ammonia (NH3-N) Total	Weekly Avg	34 mg/L	3/Week	24-Hr Flow Prop Comp	
Nitrogen, Ammonia (NH3-N) Total	Monthly Avg	34 mg/L	3/Week	24-Hr Flow Prop Comp	
PFOS		ng/L	Annual	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PFOA		ng/L	Annual	Grab	Monitoring only. See PFOS/PFOA Minimization Plan Determination of Need schedule.
Nitrogen, Total Kjeldahl		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section below.
Nitrogen, Nitrite + Nitrate Total		mg/L	See Listed Qtr(s)	24-Hr Flow Prop Comp	Annual in rotating quarters. See Nitrogen Series Monitoring section below.
Nitrogen, Total		mg/L	See Listed Qtr(s)	Calculated	Annual in rotating quarters. See Nitrogen Series Monitoring section below. Total Nitrogen shall be calculated as the sum of reported values for Total Kjeldahl Nitrogen and Total Nitrite + Nitrate Nitrogen.
Chloride		mg/L	Monthly	24-Hr Flow Prop Comp	Monitoring only in calendar year 2026.

Changes from Previous Permit

- Total suspended solids (TSS) and total phosphorus mass limitations derived consistent with the Upper Fox Wolf Basin Total Maximum Daily Load have been added. The TSS mass limits are effective immediately and the total phosphorus mass limits are effective pursuant to a compliance schedule. The permittee is now required to report the mass of TSS and total phosphorus discharged in lbs/day and lbs/month and the 12-Month Rolling Sum of Total Monthly Discharge of phosphorus in lbs/year.
- Fecal coliform monitoring and limits have been replaced with Escherichia coli (*E. coli*) monitoring and limits. *E. coli* limits of 126 #/100 ml as a monthly geometric mean and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply May through September annually.
- Acute Whole Effluent Toxicity (WET) testing is no longer required.
- Annual monitoring for total nitrogen parameters in rotating quarters throughout the permit term was added to the proposed permit.
- The permit requires monitoring only for chloride in calendar year 2026.
- ~~Monitoring once every two months for PFOS and PFOA is included in the permit in accordance with s. NR 106.98(2)(c), Wis. Adm. Code~~. The monitoring frequency for PFOS and PFOA has been reduced from 1/ 2 Months to Annual.
- The monitoring frequency for ammonia nitrogen has been increased from Weekly to 3/Week.

Explanation of Limits and Monitoring Requirements

Monitoring Frequency Evaluation: Monitoring frequencies for parameters that have final effluent limits in effect during this permit term were evaluated taking into consideration the size and type of the facility, and whether the monitoring occurs frequently enough to characterize effluent quality and variability, to detect events of noncompliance, and to ensure fairness and consistency in permits issued across the state. Monitoring frequency decisions are based on requirements in s. NR 205.066(1), Wis. Adm. Code, (decisions are case-by-case) and considering the factors in s. NR 210.04, Wis. Adm. Code, along with recommendations provided in the "Monitoring Frequencies for Individual Wastewater Permits" guidance (April 12, 2021).

The monitoring frequencies for all parameters except ammonia nitrogen in the current permit are consistent with administrative code and the above-mentioned guidance and are retained in the reissued permit. The monitoring frequency for ammonia nitrogen of Weekly in the current permit is inadequate to capture variability in ammonia discharges during a week or during the different seasons of the year and does not provide enough data to determine the need for ammonia discharge limits at the next permit reissuance.

Categorical Limits

BOD_5, TSS Concentration, pH and Dissolved Oxygen (DO) – The BOD_5, TSS concentration, pH and DO limitations for the permittee are established in s. NR 210.05(1), Wis, Adm. Code, for receiving water classified as fish and aquatic life (warmwater sport fish community) in s. NR 102.04(3), Wis. Adm. Code.

Water Quality Based Limits and WET Requirements and Disinfection

Refer to the WQBEL memo for the detailed calculations, prepared by the Water Quality Bureau dated November 18, 2021 used for this reissuance.

Disinfection/Chlorine – The permittee is required to disinfect its effluent to protect recreational uses in and on the Wolf River and in downstream waters. Because chlorine is added as a disinfectant, effluent limitations are recommended to assure proper operation of the de-chlorination system. The current permit has a daily maximum limit and weekly and monthly average limits of 38 µg/L which are continued in the reissued permit.

***E. Coli* –** Revisions to bacteria surface water quality criteria to protect recreational uses and accompanying *E. coli* WPDES permit implementation procedures became effective May 1, 2020. The new rule requires that WPDES permits for facilities with required disinfection include monitoring for *E. coli* while facilities are disinfecting during the recreation period and establish effluent limitations for *E. coli* pursuant to s. NR 210.06 (2), Wis. Adm Code. *E. coli* limits of 126 #/100 ml as a monthly geometric mean and 410 #/100 ml as a daily maximum that may not be exceeded more than 10 percent of the time in any calendar month will apply from May through September annually.

Total Maximum Daily Load (TMDL) for Total Phosphorus and TSS – The Upper Fox and Wolf Basins TMDL (UFW TMDL) Waste Load Allocations (WLAs) for total suspended solids (TSS) and total phosphorus were approved by the U.S. Environmental Protection Agency on February 27, 2020. The UFW TMDL assigns TSS and total phosphorus WLAs in pound per year to permittees in the TMDL area that are used to calculate TSS and total phosphorus mass limits in pounds per day as recommend in TMDL implementation guidance. TMDL limits are water quality based effluent limits (WQBELs).

TSS – The approved TMDL TSS WLA for this permittee is 71,012 lbs/yr resulting in calculated TSS mass limits of 402 lbs/day as a weekly average and 285 lbs/day as a monthly average. The permittee is able to consistently comply with the TMDL TSS limits and they apply on the permit effective date. The TSS mass limits are in addition to the TSS concentration limits in the monitoring table above.

Phosphorus – The approved TMDL phosphorus WLA for this permittee is 403 lbs/yr resulting in calculated phosphorus mass limits of 3.9 lbs/day as a monthly average and 1.3 lbs/day as a 6-month average. The permittee is unable to consistently comply with the TMDL total phosphorus mass limits immediately under current operation of its existing treatment system and the proposed permit includes a compliance schedule to provide the permittee with time to comply with the limits.

The 6-month average limit is expressed as a seasonal average with averaging periods occurring from May through October and November through April. Compliance with the 6-month average limit is evaluated at the end of each 6-month period on April 30th and October 31st annually.

Phosphorus Compliance Schedule – Section NR 217.17, Wis. Adm. Code, authorizes compliance schedules that provide up to nine years for permittees to comply with the total phosphorus WQBELs where a treatment facility upgrade is required to install filtration or a similar phosphorus removal process to comply with the new limits. The schedule requires the permittee to achieve compliance with the limits as soon as possible but no later than the date specified in the schedule.

It is probable that, in order to consistently comply with the phosphorus WQBELs, Winnconne will need to evaluate and implement any number of the following approaches:

- Plant optimization;
- Phosphorus source reduction;
- Pilot testing of new or additional treatment processes;
- Additional treatment processes;
- Multiple treatment processes;
- Obtaining financing for construction; or
- Potential for adaptive management and/or pollutant trading with upstream contributors, and implementation of such trades.

The Department believes that the compliance schedule suggested in the draft permit (9 years) provides the appropriate length of time for the permittee to evaluate these options, implement the chosen option and meet the final phosphorus WQBELs.

When a compliance schedule is granted to meet a WQBEL the permit must include an interim limit that applies during the compliance schedule period to prevent backsliding from current conditions. The interim phosphorus limit for this permittee is set equal to the technology-based phosphorus limit of 1.0 mg/L in the current permit.

TSS and Total Phosphorus Reporting – The permittee is required to calculate and report the daily mass discharge of phosphorus and TSS in lbs/day, the Total Monthly Discharge of TSS and phosphorus in lbs/month and the 12-Month Rolling Sum of Total Monthly Discharge of TSS and phosphorus in lbs/yr, which can be directly compared to the facility's WLAs to assess compliance.

Ammonia – Current acute and chronic ammonia toxicity criteria for the protection of aquatic life are included in Tables 2C and 4B of ch. NR 105, Wis. Adm. Code. Subchapter IV of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for ammonia. As is the case with the current permit daily maximum ammonia limits that vary with effluent pH are included. The calculated weekly and monthly average ammonia limits are higher than the 34 mg/L limits in the current permit; however, the Department would be unable to increase the limits due to the lack of need as shown via the antidegradation rule (ch. NR 207, Wis. Adm. Code)

PFOS and PFOA – NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. At the first reissuance of a WPDES permit after August 1, 2022, the new rule requires WPDES permits for municipal dischargers with an average flow rate less than 1 MGD, to be evaluated on a case-by-case basis to determine if monitoring is required pursuant to s. NR 106.98(2)(c), Wis. Adm. Code. The department evaluated the need for PFOS and PFOA monitoring taking into consideration the presence of potential PFOS or PFOA industrial wastes, remediation sites and other potential sources of PFOS or PFOA. Based on information available at the time the proposed permit was drafted, it was identified that Winneconne has an indirect discharger (Covanta Environmental Solutions) that may be a potential source of PFOS/PFOA. Therefore, monitoring once every two months is included. The initial determination of the need for sampling shall be conducted for up to two years in order to determine if the permitted discharge has the reasonable potential to cause or contribute to an exceedance of the PFOS or PFOA standards under s. NR 102.04(8)(d)1, Wis. Adm. Code. See the Schedules section for the PFOS/PFOA Minimization Plan Determination of Need schedule.

Pursuant to s. NR 205.066, Wis. Adm. Code, the department may specify the monitoring frequency for PFOS and PFOA on a case-by-case basis after the initial 24 months of sampling.

After a review of the data submitted with the Year 2 Report on Effluent Discharges, the department has determined that it is warranted to reduce the sampling frequency in this case. The department is requiring continued monitoring of these compounds to complete the permit term to ensure that the current effluent quality is maintained. At the next permit reissuance, the department will make another determination as to whether further reduction or removal of monitoring is warranted, based on the continued sampling results.

Total Nitrogen Monitoring (NO2+NO3, TKN and Total N) – The Department has included effluent monitoring for Total Nitrogen in the permit through the authority under §§ 283.55(1)(e), Wis. Stats., which allows the department to require the permittee to submit information necessary to identify the type and quantity of any pollutants discharged from the point source, and through s. NR 200.065(1)(h), Wis. Adm. Code, which allows for this monitoring to be collected during the permit term. More information on the justification to include total nitrogen monitoring in wastewater permits can be found in the "Guidance for Total Nitrogen Monitoring in Wastewater Permits" dated October 1, 2019. Annual tests are scheduled in the following rotating quarters: 3rd Quarter (July – September) 2023; 4th Quarter (October – December) 2024; 1st Quarter (January – March) 2025; 2nd Quarter (April – June) 2026; and 3rd Quarter (July – September) 2027.

Chloride – Acute and chronic chloride toxicity criteria for the protection of aquatic life are included in Tables 1 and 5 of ch. NR 105, Wis. Adm. Code. Subchapter VII of ch. NR 106 establishes the procedure for calculating water quality based effluent limitations (WQBELs) for chloride. The permittee's effluent data shows that chloride limits are not required. The permit requires monthly chloride monitoring in calendar year 2026 to provide data to evaluate the need for chloride limits at the next permit reissuance.

Whole Effluent Toxicity – Whole effluent toxicity (WET) testing requirements and limits (if applicable) are determined in accordance with ss. NR 106.08 and NR 106.09 Wis. Adm. Code, as revised August 2016. (See the current version of the Whole Effluent Toxicity Program Guidance Document and checklist and WET information, guidance and test methods at http://dnr.wi.gov/topic/wastewater/wet.html). The current permit required acute WET tests during the permit term. No WET testing is recommended for the proposed permit because of the low risk in effluent toxicity.

3 Land Application - Proposed Monitoring and Limitations

Municipal Sludge Description						
Sample Point	**Sludge Class (A or B)**	**Sludge Type (Liquid or Cake)**	**Pathogen Reduction Method**	**Vector Attraction Method**	**Reuse Option**	**Amount Reused/Disposed (Dry Tons/Year)**
002	B	Liquid	All sludge from this facility was pressed into cake and land applied from Outfall 003 during the previous permit term.			
003	B	Cake	Fecal Coliform	Incorporation	Land Application	48 dry US tons
Does sludge management demonstrate compliance? Yes						
Is additional sludge storage required? No						
Is Radium-226 present in the water supply at a level greater than 2 pCi/liter? Yes If yes, special monitoring and recycling conditions will be included in the permit to track any potential problems in land applying sludge from this facility						
Is a priority pollutant scan required? No Priority pollutant scans are required once every 10 years at facilities with design flows between 5 MGD and 40 MGD, and once every 5 years if design flow is greater than 40 MGD.						

Sample Point Number: 002- Liquid Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Per Occurrence	Composite	Monitoring is required once in any year that liquid sludge is land applied.
Arsenic Dry Wt	Ceiling	75 mg/kg	Per Occurrence	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Per Occurrence	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Per Occurrence	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Per Occurrence	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Per Occurrence	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Copper Dry Wt	High Quality	1,500 mg/kg	Per Occurrence	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Per Occurrence	Composite	Monitoring is required once in any year that liquid sludge is land applied.
Lead Dry Wt	High Quality	300 mg/kg	Per Occurrence	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Per Occurrence	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Per Occurrence	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Per Occurrence	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Per Occurrence	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Per Occurrence	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Per Occurrence	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Per Occurrence	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Per Occurrence	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Per Occurrence	Composite	
Radium 226 Dry Wt		pCi/g	Per Occurrence	Composite	
Nitrogen, Total Kjeldahl		Percent	Per Cycle	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Per Occurrence	Composite	
Phosphorus, Total		Percent	Per Occurrence	Composite	
Phosphorus, Water Extractable		% of Tot P	Per Occurrence	Composite	
Potassium, Total Recoverable		Percent	Per Occurrence	Composite	

Changes from Previous Permit:

There have been no changes to the monitoring requirements or limitations for Outfall 002 – Liquid Sludge.

Sample Point Number: 003- Cake Sludge

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
Solids, Total		Percent	Annual	Composite	
Arsenic Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Arsenic Dry Wt	High Quality	41 mg/kg	Annual	Composite	
Cadmium Dry Wt	Ceiling	85 mg/kg	Annual	Composite	
Cadmium Dry Wt	High Quality	39 mg/kg	Annual	Composite	
Copper Dry Wt	Ceiling	4,300 mg/kg	Annual	Composite	
Copper Dry Wt	High Quality	1,500 mg/kg	Annual	Composite	
Lead Dry Wt	Ceiling	840 mg/kg	Annual	Composite	
Lead Dry Wt	High Quality	300 mg/kg	Annual	Composite	
Mercury Dry Wt	Ceiling	57 mg/kg	Annual	Composite	
Mercury Dry Wt	High Quality	17 mg/kg	Annual	Composite	
Molybdenum Dry Wt	Ceiling	75 mg/kg	Annual	Composite	
Nickel Dry Wt	Ceiling	420 mg/kg	Annual	Composite	
Nickel Dry Wt	High Quality	420 mg/kg	Annual	Composite	
Selenium Dry Wt	Ceiling	100 mg/kg	Annual	Composite	
Selenium Dry Wt	High Quality	100 mg/kg	Annual	Composite	
Zinc Dry Wt	Ceiling	7,500 mg/kg	Annual	Composite	
Zinc Dry Wt	High Quality	2,800 mg/kg	Annual	Composite	
Radium 226 Dry Wt		pCi/g	Annual	Composite	
Nitrogen, Total Kjeldahl		Percent	Annual	Composite	
Nitrogen, Ammonium (NH4-N) Total		Percent	Annual	Composite	
Phosphorus, Total		Percent	Annual	Composite	
Phosphorus, Water Extractable		% of Tot P	Annual	Composite	
Potassium, Total Recoverable		Percent	Annual	Composite	

Monitoring Requirements and Limitations					
Parameter	**Limit Type**	**Limit and Units**	**Sample Frequency**	**Sample Type**	**Notes**
PCB Total Dry Wt	Ceiling	50 mg/kg	Once	Composite	Monitor in 2024. See Sludge Analysis for PCBs section below.
PCB Total Dry Wt	High Quality	10 mg/kg	Once	Composite	

Changes from Previous Permit:

There have been no changes to the monitoring requirements or limitations for Outfall 003 – Cake Sludge.

Explanation of Limits and Monitoring Requirements

Monitoring Frequency Analysis: Pursuant to s. NR 204.06(c)3, Wis. Adm. Code, the frequency of monitoring for sludge characteristics is based on the quantity of sludge land applied annually. Winneconne land applies less than 320 dry US tons of sludge annually and the required monitoring frequency is annually. Winneconne presses (dewaters) all of its sludge into cake, which is land applied from Outfall 003. Liquid sludge from Outfall 002 has not been land applied in the past five years. The monitoring frequency for sludge from Outfall 002 is "Per Occurrence" and monitoring is only required in years that sludge is land applied.

Requirements for land application of municipal sludge are determined in accordance with ch. NR 204 Wis. Adm. Code. Ceiling and high-quality limits for metals in sludge are specified in s. NR 204.07(5). Requirements for pathogens are specified in s. NR 204.07(6) and in s. NR 204.07 (7) for vector attraction requirements. Limitations for PCBs are addressed in s. NR 204.07(3)(k). Radium requirements are addressed in s. NR 204.07(3)(n).

Water extractable phosphorus (WEP) – WEP is the coefficient for determining plant available phosphorus from measured total phosphorus. In Wisconsin, the Penn State Method is utilized and is expressed in percent. While a total P may be significant, the WEP may show that only a small percentage of the P is available to plants because of factors such as treatment processes and chemical addition that "tie-up" phosphorus limiting the amount of phosphorus that is plant available. As part of the Wisconsin's nutrient management plan (NMP) requirements, the accounting of all fertilizers must be included over the NMP cycle. The fertilizer value of the waste needs to be communicated to the farmer and accounted for in the NMP.

4 Schedules

4.1 TMDL Water Quality-Based Effluent Limits (WQBELs) for Total Phosphorus

The permittee shall comply with the WQBELs for Phosphorus as specified. No later than 14 days following each compliance date, the permittee shall notify the Department in writing of its compliance or noncompliance. If a submittal is required, a timely submittal fulfills the notification requirement.

Required Action	Due Date
Operational Evaluation Report: The permittee shall prepare and submit to the Department for approval an operational evaluation report. The report shall include an evaluation of collected effluent data, possible source reduction measures, operational improvements or other minor facility modifications that will optimize reductions in phosphorus discharges from the treatment plant during the period prior to complying with final phosphorus WQBELs and, where possible, enable compliance with final phosphorus WQBELs by December 31, 2025. The report shall provide a plan and schedule for implementation of the measures, improvements, and modifications as soon as possible, but not later than December 31, 2025 and state whether the measures, improvements, and modifications will enable compliance with final phosphorus WQBELs. Regardless of whether they are expected to result	12/31/2023

in compliance, the permittee shall implement the measures, improvements, and modifications in accordance with the plan and schedule specified in the operational evaluation report. If the operational evaluation report concludes that the facility can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the permittee shall comply with the final phosphorus WQBEL by December 31, 2025 and is not required to comply with the milestones identified below for years 3 through 9 of this compliance schedule ('Preliminary Compliance Alternatives Plan', 'Final Compliance Alternatives Plan', 'Final Plans and Specifications', 'Treatment Plant Upgrade to Meet WQBELs', 'Complete Construction', 'Achieve Compliance'). STUDY OF FEASIBLE ALTERNATIVES - If the Operational Evaluation Report concludes that the permittee cannot achieve final phosphorus WQBELs with source reduction measures, operational improvements and other minor facility modifications, the permittee shall initiate a study of feasible alternatives for meeting final phosphorus WQBELs and comply with the remaining required actions of this schedule of compliance. If the Department disagrees with the conclusion of the report and determines that the permittee can achieve final phosphorus WQBELs using the existing treatment system with only source reduction measures, operational improvements, and minor facility modifications, the Department may reopen and modify the permit to include an implementation schedule for achieving the final phosphorus WQBELs sooner than December 31, 2031.	
Compliance Alternatives, Source Reduction, Improvements and Modifications Status: The permittee shall submit a 'Compliance Alternatives, Source Reduction, Operational Improvements and Minor Facility Modification' status report to the Department. The report shall provide an update on the permittee's: (1) progress implementing source reduction measures, operational improvements, and minor facility modifications to optimize reductions in phosphorus discharges and, to the extent that such measures, improvements, and modifications will not enable compliance with the WQBELs, (2) status evaluating feasible alternatives for meeting phosphorus WQBELs.	12/31/2024
Preliminary Compliance Alternatives Plan: The permittee shall submit a preliminary compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment facility is necessary to achieve final phosphorus WQBELs, the submittal shall include a preliminary engineering design report. If the plan concludes Adaptive Management will be used, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 without the Adaptive Management Plan. If water quality trading will be undertaken, the plan must state that trading will be pursued.	12/31/2025
Final Compliance Alternatives Plan: The permittee shall submit a final compliance alternatives plan to the Department. If the plan concludes upgrading of the permittee's wastewater treatment is necessary to meet final phosphorus WQBELs, the submittal shall include a final engineering design report addressing the treatment plant upgrades, and a facility plan if required pursuant to ch. NR 110, Wis. Adm. Code. If the plan concludes Adaptive Management will be implemented, the submittal shall include a completed Watershed Adaptive Management Request Form 3200-139 and an engineering report addressing any treatment system upgrades necessary to meet interim limits pursuant to s. NR 217.18, Wis. Adm. Code. If the plan concludes water quality trading will be used, the submittal shall identify potential trading partners.	12/31/2026

Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	
Progress Report on Plans & Specifications: Submit progress report regarding the progress of preparing final plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	12/31/2027
Final Plans and Specifications: Unless the permit has been modified, revoked and reissued, or reissued to include Adaptive Management or Water Quality Trading measures or to include a revised schedule based on factors in s. NR 217.17, Wis. Adm. Code, the permittee shall submit final construction plans to the Department for approval pursuant to s. 281.41, Stats., specifying treatment plant upgrades that must be constructed to achieve compliance with final phosphorus WQBELs, and a schedule for completing construction of the upgrades by the complete construction date specified below. (Note: Permit modification, revocation and reissuance, and reissuance are subject to s. 283.53(2), Stats.) Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2028
Treatment Plant Upgrade to Meet WQBELs: The permittee shall initiate construction of the upgrades. The permittee shall obtain approval of the final construction plans and schedule from the Department pursuant to s. 281.41. Stats. Upon approval of the final construction plans and schedule by the Department pursuant to s. 281.41, Stats., the permittee shall construct the treatment plant upgrades in accordance with the approved plans and specifications. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2029
Construction Upgrade Progress Report #1: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2030
Construction Upgrade Progress Report #2: The permittee shall submit a progress report on construction upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	03/31/2031
Complete Construction: The permittee shall complete construction of wastewater treatment system upgrades. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	11/30/2031
Achieve Compliance: The permittee shall achieve compliance with final phosphorus WQBELs. Note: See 'Alternative Approaches to Phosphorus WQBEL Compliance' in the Surface Water section of this permit.	12/31/2031

4.2 PFOS/PFOA Minimization Plan Determination of Need

Required Action	Due Date
Report on Effluent Discharge: Submit a report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and PFOA concentrations. This analysis should also include a comparison to the applicable narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code. This report shall include all PFOS and PFOA data collected including any voluntary influent, intake, in-plant, collection system sampling, and blank sample results.	12/31/2023
Report on Effluent Discharge and Evaluation of Need: Submit a final report on effluent PFOS and PFOA concentrations and include an analysis of trends in monthly and annual average PFOS and	12/31/2024

PFOA concentrations of data collected over the last 24 months. The report shall also provide a comparison on the likelihood of the facility needing to develop a PFOS/PFOA minimization plan. This report shall include all PFOS and PFOA data collected including any voluntary influent, intake, in-plant, collection system sampling, and blank sample results. The permittee shall also submit a request to the department to evaluate the need for a PFOS/PFOA minimization plan. If the Department determines a PFOS/PFOA minimization plan is needed based on a reasonable potential evaluation, the permittee will be required to develop a minimization plan for Department approval no later than 90 days after written notification was sent from the Department. The Department will modify or revoke and reissue the permit to include PFOS/PFOA minimization plan reporting requirements along with a schedule of compliance to meet WQBELs. Effluent monitoring of PFOS and PFOA shall continue as specified in the permit until the modified permit is issued. If, however, the Department determines there is no reasonable potential for the facility to discharge PFOS or PFOA above the narrative standard in s. NR 102.04(8)(d), Wis. Adm. Code, no further action is required and effluent monitoring of PFOS and PFOA shall continue as specified in the permit.	

4.3 Land Application Management Plan

A management plan is required for the land application system.

Required Action	Due Date
Land Application Management Plan Submittal: Submit a management plan to optimize the land application system performance and demonstrate compliance with ch. NR 204, Wis. Adm. Code, by the Due Date. This management plan shall 1) specify information on pretreatment processes (if any); 2) identify land application sites; 3) describe site limitations; 4) address vegetative cover management and removal; 5) specify availability of storage; 6) describe the type of transporting and spreading vehicle(s); 7) specify monitoring procedures; 8) track site loading; 9) address contingency plans for adverse weather and odor/nuisance abatement; and 10) include any other pertinent information. Once approved, all landspreading activities shall be conducted in accordance with the plan. Any changes to the plan must be approved by the Department prior to implementing the changes.	12/31/2024

Explanation of Schedules

Effluent Limitations for E. coli

A compliance schedule is included in the permit to provide time for the permittee to investigate options for meeting new effluent E. coli water quality-based effluent limits while coming into compliance with the limits as soon as reasonably possible.

TMDL Water Quality Based Effluent Limits (WQBELs) for Total Phosphorus

The permittee is unable to immediately comply with the new, more stringent phosphorus WQBELs that were derived consistent with the Lower Fox Wolf Basin Total Maximum Daily Load (TMDL) and TMDL implementation guidance. This schedule provides the permittee up to nine years to comply with total phosphorus WQBELs. Compliance is required as soon as possible but no later than December 31, 2031. The length of the schedule is appropriate because the permittee's treatment facility will likely need to be upgraded to add a tertiary phosphorus removal process such as filtration or a similar process to meet the stringent phosphorus WQBELs.

PFOS/PFOA Minimization Plan Determination of Need

As stated above, NR 106 Subchapter VIII – Permit Requirements for PFOS and PFOA Dischargers became effective on August 1, 2022. S. NR 106.98, Wis. Adm. Code, specifies steps to generate data in order to determine the need for reducing PFOS and PFOA in the discharge. Data generated per the effluent monitoring requirements will be used to determine the need for developing a PFOS/PFOA minimization plan. As part of the schedule, the permittee is required to submit two annual Reports on Effluent Discharge.

If the Department determines that a minimization plan is needed, the permit will be modified or revoked/reissued to include additional requirements.

Land Application Management Plan

The permittee shall prepare a land application management plan to assure that sewage sludge is managed in accordance with the requirements of chapter NR 204, Wis. Adm. Code.

Attachments:

~~Water Quality Based Effluent Limits – November 18, 2021~~

PFOS and PFOA Water Quality-Based Effluent Limitations for the Winneconne Wastewater Treatment Facility - WPDES Permit No. (WI-0021938) in Winnebago County, by Amy Garbe, PE, Wastewater Engineer, dated January 15, 2025

Proposed Expiration Date:

December 31, 2027

Prepared By:

Phillip Spranger, Wastewater Specialist

Date: December 22, 2022

Revised By: Sarah Donoughe, Wastewater Specialist-Adv

Date: January 23, 2025

DATE: January 15, 2025

TO: Sarah Donoughe – NER

FROM: Kari Fleming – WY/3

SUBJECT: PFOS and PFOA Water Quality-Based Effluent Limitations for the Winneconne Wastewater Treatment Facility -WPDES Permit No. (WI-0021938) in Winnebago County

This is in response to your request for an evaluation of the need for PFOS and PFOA limitations for the Winneconne WWTF. The wastewater treatment plant discharges effluent to the Wolf River located in the Wolf River Basin.

The current permit, effective since January 2023, has monitoring only for PFOS and PFOA. The following review is based on new regulations which are now in effect throughout the state of Wisconsin and recommendations are made in accordance with chapters NR 102, 104, 105, 106, 207, and 217 of the Wisconsin Administrative Code, where applicable.

Receiving Water Information

- Name: Wolf River
- Classification: Warm Water Sport Fish (WWSF) community, non-public water supply
- Flow: The following 7-Q10 and 7-Q2 values are from USGS, where Outfall 001 is located:
  7-Q10 = 760 cfs (cubic feet per second)
  7-Q2 = 988 cfs
  Harmonic Mean Flow = 1688 cfs using a drainage area of 3717 mi^2

  The Harmonic Mean has been estimated based on average flow and the 7-Q10 using an equation from U.S. EPA's Technical Support Document for Water Quality-Based Toxics Control (March 1991, EPA/505/2-90-001, pgs. 88-89).
- % of Flow used to calculate limits: 25%

Effluent Information

- Flow: Average Design Flow = 0.777 MGD, for reference, the actual average flow from January 2023 through November 2024 was 0.414 MGD.
- Effluent characterization: This facility is categorized as a minor municipality

The following table lists the statistics for effluent PFOS and PFOA levels from February 2023 through November 2024.

	PFOS ng/L	PFOA ng/L
1-day P_{99}	3.71	8.06
4-day P_{99}	3.26	5.24
30-day P_{99}	2.52	3.80
Mean*	2.16	3.11
Std	0.49	1.49
Sample Size	12	12

Range	<1.0-2.9	0.85-6.4

*Results below the level of detection (LOD) were included as zeroes in calculation of average.

Water Quality Based Limit – PFOS and PFOA

Administrative rules for PFOS and PFOA took effect on August 1, 2022. These rule revisions include additions to ch. NR 102 (s. NR 102.05), Wis. Adm. Code, which establish PFOS and PFOA standards for surface waters. Revisions to ch. NR 106 (s. NR 106, Subchapter VIII), Wis. Adm. Code establish procedures for determining water quality based effluent limits for PFOS and PFOA, based on the applicable standards in ch. NR 102, Wis. Adm. Code.

PFOS

Due to PFOS being a bioaccumulating compound of concern (BCC), no mixing zone is allowed pursuant s. NR 106.98(4), Wis. Adm. Code. Therefore, the effluent limit for PFOS is set equal to criteria (8 ng/L).

PFOA

The conservation of mass equation is described in s. NR 106.06(4)(b)1. Wis. Adm. Code, and includes variables of water quality criterion (WQC), receiving water flow rate (Qs), effluent flow rate (Qe), and upstream PFOA concentrations (Cs) provided below.

$$\text{Limitation} = [(WQC)(Qs+(1-f)\,Qe) - (Qs-f\,Qe)\,(Cs)]/Qe$$

Where:

WQC = 95 ng/L for the Wolf River
Qs = 25% of the harmonic mean pursuant s. NR 106.06(4)(c)10., Wis. Adm. Code = 422 cfs
Cs = background concentration of PFOA in the receiving water pursuant to s. NR 106.06(4)(e), Wis. Adm. Code
Qe = effluent flow rate = 0.777 MGD = 1.20 cfs
f = the fraction of effluent withdrawn from the receiving water = 0

After substituting the appropriate variables, the calculated PFOA limit is 33,441 ng/L.

Reasonable Potential Determination

In accordance with s. NR 106.98(4)(a), Wis. Adm. Code, **the discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion for PFOS** because the 30-day P_{99} of reported effluent PFOS data is less than the calculated WQBEL (8 ng/L). Therefore, **a WQBEL is not required.**

The discharge does not have reasonable potential to cause or contribute to an exceedance of the water quality criterion for PFOA because the 30-day P_{99} of reported effluent PFOA data is less than the calculated WQBEL (33,441 ng/L). Therefore, **a WQBEL is not required.**

Conclusions

The discharge has no reasonable potential to cause or contribute to an exceedance of the water quality criterion for PFOS nor PFOA. Therefore, no WQBELs are required.

Pursuant to s. NR 205.066, Wis. Adm. Code, the department may specify the monitoring frequency for PFOS and PFOA on a case-by-case basis after the initial 24 months of sampling. **After a review of the available data, the department has determined that it is warranted to reduce the sampling**

frequency in this case to annual.

If there are any questions or comments on these recommendations, please contact Amy Garbe by telephone at (608) 716-9968 or by email at Amy.Garbe@wisconsin.gov.

Attachments (2) – P99 Calculations

PREPARED BY: Amy Garbe date: 1/15/25

Amy Garbe, P.E., Wastewater Engineer

cc: Barti Oumarou, Basin Engineer – NER/Oshkosh
Nate Willis, P.E., PFAS Implementation Coordinator – CO

Attachment 1 – PFOS P99 Calculation

EFFLUENT VARIABILITY ANALYSIS -			
=	= =	=	=
SUBSTANCE:			
NUMBER OF VALUES:	------		
TOTAL	12		
DETECTED	11		
NON-DETECTED	1		
d	0.083333		
m	2.354545		
mean of all data	2.158333		
s	0.492674		
	------	------	------
n	1	4	30
d^n	0.083333	4.82E-05	4.21E-33
p	0.989091	0.99	0.99
Z_p	2.293958	2.326767	2.326785
1+(s/m)^2	1.043783	1.043783	1.043783
(sigma_d)^2	0.042852	0.042852	0.042852
mu_d	0.834922	0.834922	0.834922
(sigma_dn)^2	0.042852	0.034032	0.004612
mu_dn	0.834922	0.752368	0.76703
P_99 exponent	1.309785	1.181608	0.925042
	-------	-------	-------
P_99	3.71	3.26	2.52
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Data Summary

Feb-23	2.2
Mar-23	2.2
Jun-23	2.9
Jul-23	2.7
Sep-23	2.6
Nov-23	2.3
Jan-24	2.4
Apr-24	1.4
Jun-24	2.7
Aug-24	2.9
Sep-24	<1.0
Nov-24	1.6

Attachment 2 – PFOA P99 Calculation

EFFLUENT VARIABILITY ANALYSIS -			
=	= =	=	=
SUBSTANCE:			
NUMBER OF VALUES:	------		
TOTAL	12		
DETECTED	12		
NON-DETECTED	0		
d	0		
m	3.1125		
mean of all data	3.1125		
s	1.48632		
	------	------	------
n	1	4	30
d^n	0	0	0
p	0.99	0.99	0.99
Z_p	2.326785	2.326785	2.326785
1+(s/m)^2	1.228037	1.228037	1.228037
(sigma_d)^2	0.205417	0.205417	0.205417
mu_d	1.032718	1.032718	1.032718
(sigma_dn)^2	0.205417	0.055444	0.007573
mu_dn	1.032718	1.107704	1.13164
P_99 exponent	2.087286	1.65558	1.334117
	-------	-------	-------
P_99	8.06	5.24	3.80
	-------	-------	-------

Data Summary

Feb-23	1.6
Mar-23	2.2
Jun-23	4.6
Jul-23	6.4
Sep-23	4.4
Nov-23	2.9
Jan-24	3.2
Apr-24	2.3
Jun-24	3
Aug-24	3.5
Sep-24	0.85
Nov-24	2.4